MINNESOTA

CLEAN ENERGY ECONOMY PROFILE

—

DETAILED APPENDIX

OCTOBER 2014

Complete Clean Energy Sector Descriptions

The table below includes expanded descriptions of each clean energy sector and was developed by Collaborative Economics in collaboration with Minnesota's Department of Commerce, Division of Energy Resources.

	Sector Description	Subsector	Subsector Description
Energy Efficiency	Technologies, methods or strategies that result in using less energy to produce the same service or product, or to provide the same level of performance, comfort or convenience. It can include a conservation or efficiency strategy that helps users save energy in the built environment (e.g. insulation, sealing, building envelope, weatherization, energy management systems/building automation, green roofs, improved new or remodeled building design and construction), or a specific technology that is Energy Star certified or more efficient than traditional types (e.g. LED lights, combined heat and power [CHP], Energy Star appliances or windows, ground source heat pumps, electronically commutated motors). Due to budget constraints this analysis does not include energy (fuel) efficiency, such as regenerative braking or high efficiency engines for vehicles.	**Building Energy Management System**	Building Energy Management includes residential, commercial or industrial building energy management/automation systems for the purpose of saving energy
		Green Buildings	Green Building includes windows, green roofs, LEED contractors, certified green building materials
		Lighting	Lighting includes LEDs, compact fluorescents, etc.
		Weatherization	Weatherization includes insulation, sealing, energy audits or assessments, building envelope
		Combined Heat and Power	Combined Heat and Power (CHP) or cogeneration units. Can be either a topping cycle system (in which the energy normally lost in a prime mover's hot exhaust and cooling systems is recovered to provide heat for industrial possesses), or bottoming cycle system (waste heat recovery, in which heat rejected from a process is used to produce electricity)
		Appliances and Equipment	Appliances and Equipment includes Energy Star certified appliances, boilers and HVAC equipment , ground source heat pumps, efficient home motors, etc. It also includes operation and maintenance, commissioning, retro-commissioning and recommissioning efforts which keep equipment operating at peak efficiency
		Other	
Wind Power	Wind power technology encompasses turbines, blades, and towers, and related components and services, such as site development and installation for the residential, commercial and utility-scale markets.	**Turbines**	
		Blades	
		Towers	
		Other	
Solar Energy	Solar energy technology includes solar thermal, solar hot water, and photovoltaic (PV) for the residential, commercial and utility-scale markets. It can include solar system components including inverters, racking, other balance of system, and monitoring equipment, and services such as installation, finance, consulting, and manufacturing.	**Photovoltaic (PV)**	
		Solar Thermal	
		Other	
Bioenergy	Technology that uses biomass (e.g. wood, grasses corn, soy, municipal solid waste and gas) to produce heat, electricity, fuel, and/or chemicals, and include services such as research, production, and sales of the products.	**Alternative Transportation Fuels**	Alternative Transportation Fuels include non-petroleum based fuels ethanol and biodiesel and the products used to make them.
		Biobased Products	Biobased products are made from biomass (e.g. corn, soy, grasses) and may include biochemicals, bioplastics, etc.
		Biomass to Energy	Biomass to Energy includes biomass (e.g. wood, municipal solid waste) that produces renewable natural gas, heat, or electricity.
		Other	
Smart Grid	""Smart grid" refers to integrated, automated communication between components of the electric grid; including centralized and distributed energy production, transmission and use. Smart Grid systems are made possible by computer processing and two-way communication between control centers, transmission networks, substations and end users. It commonly includes sensing and measurement technologies, automated controls for distribution and repairs, energy storage, improved management dashboards and decision support software which improve the reliability, quality and economics of electric power.	**Smart Meters and Measuring Devices**	Smart Meters and Measuring Devices include intelligent (2-way+) meters and supporting measuring devices for residential, commercial, and industrial sectors
		Demand Response Management	Demand Response Management includes software to measure and manage energy and power flow for utility sectors
		Energy Storage	Energy Storage includes grid-scale batteries, EV batteries, flywheels, compressed air storage
		Transmission and Distribution	
		Other	

Clean Energy Savings and Installation Data

The Minnesota Department of Commerce provided data for energy efficiency savings, solar, and wind installation capacity.

The Minnesota Department of Agriculture provided data for ethanol and biodiesel production capacity and number of plants.

The US Energy Information Administration provided data for bioenergy electricity generation as net generation of electricity by energy source.

This report does not attempt to quantify the opportunity costs and benefits of alternative clean energy policies and investments, focusing instead on identifying the job and economic development occurring from private sector activity and the correlating policies undergoing implemented in Minnesota during that period.

Employment Data Methodology

Collaborative Economics has developed a multifaceted approach for identifying and tracking the growth of businesses with primary activities in the Clean Energy Economy. This methodology was originally developed for work carried out on behalf of Next 10, a California-based nonprofit, and published in the California Green Innovation Index and Many Shades of Green (2008, 2009, 2010, 2012, 2013, and 2014), and was enhanced and revised in conjunction with Minnesota's Department of Employment and Economic Development (DEED) Economic Analysis Unit.

Constructing the MN Clean Energy Economy employment database involved multiple data sources. To identify the potential Clean Energy Economy businesses, Collaborative Economics, in coordination with the State and industry stakeholders, developed a list of standard industrial classification (SIC) and North American Industry Classification System (NAICS) codes (Exhibits A & B) likely to include at least some clean energy companies, drawing on clean economy jobs and technology literature, as well as independent review of the industry code. In addition to these industry codes, Collaborative Economics identified specific companies active in the clean energy economy, leveraging multiple data sources, including records of clean energy investments (e.g. Bloomberg New Energy Finance, CB Insights), industry associations or databases (e.g. Solar Energy Industries Association, American Wind Energy Association, Renewable Fuels Association), media sources (e.g. GreenTech Media, CleanTechnica) and Minnesota's prior research and industry engagement efforts.

Employment data is primarily from the 2012 National Establishments Time Series (NETS) database. The NETS database was developed by Walls & Associates, based on Dun & Bradstreet business-unit data and represents a census of jobs and establishments for January of the given year. The Institute for Exceptional Growth Companies (IEGC) at the University of Wisconsin Extension Division of Entrepreneurship and Economic Development provided 2013 and 2014 employment data, which was appended to the 2012 NETS database by Collaborative Economics. IEGC assembled, verified and, where necessary, updated Dun & Bradstreet data for latest full calendar year rolling through each current quarter.

Collaborative Economics leveraged the industry codes and company lists to identify specific Clean Energy Economy establishments within Minnesota. First, Collaborative Economics extracted all business locations in the SIC code lists, and manually reviewed them. Next, Collaborative Economics initiated phone number, address and company name searches to located businesses in NETS discovered through the industry association, investment and various other sources lists. Once those results were integrated, Collaborative Economics extracted and manually reviewed business locations from the NAICS code lists. Through this automated and manual verification of these establishments, Collaborative Economics identified companies from within the potential list of companies that conducted a majority of their business activities in the clean energy economy, and assigned an appropriate clean energy segment and value chain. Identification of companies focused on establishments with employment in 2012-2014, and therefore does not include a full analysis of companies that may have been active in earlier years (e.g. 2000-2001) and closed before 2012. In cases where the results were uncertain and the activities of a business establishment could not be verified (e.g. on a company's website, through public record), the establishment was not included. Therefore, the analysis offers a conservative tracking of jobs in the Clean Energy Economy.

The jobs numbers reported in the database reflect all jobs at each vetted business location for which a majority of the business operations are in the clean economy. In the case of multi-establishment companies, only the clean energy establishments are included.

To further refine and tailor Minnesota's Clean Energy Economy jobs database, DEED issued a survey to businesses potentially in clean energy sectors regarding employment and revenue activity in each sector (Exhibit C). Collaborative Economics used the survey results to identify additional establishments, and to apportion more specific levels of

employment within companies to clean energy sectors and value chain functions. The integration protocol varied by closeness of match with NETS/IEGC data (Exhibit D). Establishments that reported clean energy employment at significantly different levels than the NETS/IEGC data were cross checked with DEED databases and, if appropriate, employment was adjusted and/or deflated over time at the average growth rate of the companies' respective clean energy sector. A total of 7,900 emails were sent (including to multiple within a company), and as of July 22, 2014, 417 companies responded to the survey, for a response rate of 5.3%. A total of 335 companies provided usable employment information included in the final analysis.

Regional analysis uses Minnesota Initiative Foundation regions. These regions are larger groupings of the ten economic development regions serviced by the state's Department of Employment and Economic Development. The seven regions include the following counties:

- **Central Region includes:** Benton, Cass, Chisago, Crow Wing, Isanti, Kanabec, Mille Lacs, Morrison, Pine, Sherburne, Stearns, Todd, Wadena and Wright Counties
- **Northeast Region includes:** Aitkin, Carlton, Cook, Itasca, Koochiching, Lake and St. Louis Counties
- **Northwest Region includes:** Beltrami, Clearwater, Hubbard, Kittson, Lake of the Woods, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake, and Roseau Counties
- **Southern Region includes:** Blue Earth, Brown, Dodge, Faribault, Fillmore, Freeborn, Goodhue, Houston, Le Sueur, Martin, Mower, Nicollet, Olmsted, Rice, Sibley, Steele, Wabasha, Waseca, Watonwan and Winona Counties
- **Southwest Region includes:** Big Stone, Chippewa, Cottonwood, Jackson, Kandiyohi, Lac qui Parle, Lincoln, Lyon, McLeod, Meeker, Murray, Nobles, Pipestone, Redwood, Renville, Rock, Swift and Yellow Medicine Counties
- **Twin Cities Metro includes:** Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties
- **West Central Region includes:** Becker, Clay, Douglas, Grant, Otter Tail, Pope, Stevens, Traverse and Wilkin Counties

Employment and Wage Methodology Acronym List	
DEED	Minnesota Department of Employment and Economic Development
IEGC	Institute for Exceptional Growth Companies at the University of Wisconsin Extension Division of Entrepreneurship and Economic Development
NAICS	North American Industry Classification System
NETS	National Establishments Time Series database
SIC	Standard Industry Classification
UI	Unemployment Insurance

Wage Data Methodology

Minnesota's DEED Economic Analysis unit conducted wage analysis using establishments identified in NETS/IEGC (described in employment methodology above) and Minnesota's unemployment insurance (UI) records. Minnesota's UI record database is a joint effort of DEED and the Bureau of Labor Statistics. This "employment census" is comprised of data reported by employers as part of unemployment compensation filings (ES-202 Program) and covers approximately 97 percent of statewide employment. All UI disclosure rules were strictly adhered to. Special care was taken to ensure the anonymity of UI covered firms—in particular, efforts were made to ensure no individual firm payroll data was disclosed to any parties or was otherwise calculable.

Using a crosswalk provided by Dun & Bradstreet of DUNS numbers with tax identification numbers and a manual review process, researchers linked firms from the NETS/IEGC database to DEED's UI records. In doing so, DEED staff were able to link 89 percent of employment identified by NETS/IEGC to an employer over the period. The firms researchers were unable to identify tended to be small (<five employees) and recently founded. This finding is consistent with academic critiques of differences between NETS and the ES-202 program.[1]

To calculate total Clean Energy payroll, researchers took annual total UI wages of clean energy firms and divided by total UI employment in these firms to get an average UI worker wage per year. Researchers then multiplied average UI worker wage by the number of NETS clean energy employees for that firm and year, resulting in the total overall wage amount.

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[1] Kunkle, G. (2011). Business Establishment Employment Data: Nets Versus Es-202. Edward Lowe Foundation's Institute for Exceptional Growth Companies. Retrieved from: http://exceptionalgrowth.org/insights/NETSvsES-202.pdf

DEED staff manually reviewed and adjusted as necessary to ensure consistency between the two sources. On occasion, NETS/IEGC and UI employment figures were dissimilar—generally due to NETS/IEGC lagging UI data. Manual review smoothed this lagging to remove any unrepresentative volatility in wages and payroll.

In the 11 percent of cases in which researchers were unable to link a NETS/IEGC employer to the UI database, the research team used the average wage rate and multiplied by the remaining NETS/IEGC clean energy employees by sector and added to clean energy total wages.

To calculate average wage, NETS/IEGC clean energy employment was divided by total clean energy wages. Each companies wage rate was examined for consistency. Any average wage rate that was three standard deviations greater than mean or less than $25,000 annually was compared to UI average wages to ensure it was in realistic bounds. If it was not, it was adjusted to better reflect actual wages.

All wages were adjusted for inflation using the U.S. city average Consumer Price Index of all urban consumers, published by the Bureau of Labor Statistics.

Early Stage Investment in Clean Energy
Clean energy investment data are provided by CB Insights™ (www.cbinsights.com) and includes disclosed investment deals in private companies. Data is through December 2013. All figures were adjusted for inflation using the U.S. city average Consumer Price Index of all urban consumers, published by the Bureau of Labor Statistics.
Early Stage investment data includes venture capital (Angel, Seed, Series A-E+, Growth Equity, Bridge, and Incubator series types), debt (credit and loans from private investors such as banks, investment funds, and financial services groups), and grants from federal and state government agencies. Venture capital investment comprises the vast majority (93% of 2004-2013 total) of early stage investment in Minnesota.

Clean Energy Patents
For Solar, Wind, Bioenergy, and Smart Grid sectors, 1790 Analytics developed and performed the search of U.S. Patent data from the U.S. Patent & Trade Office based on search criteria defined in conjunction with Collaborative Economics. Smart Grid sector patents include Energy Infrastructure, Battery, Fuel Cell (not for vehicles) categories.

Energy efficiency sector patents were compiled from a custom search by Collaborative Economics. Analysis used U.S. Patent & Trade Office Custom Data Extracts and identified codes from an independent review of International Patent Classification codes listed in the World Intellectual Property Organization's IPC Green Inventory. Collaborative Economics removed any duplicates in categories.

Project Financing
Project financing investment data are provided by Bloomberg New Energy Finance (www.bnef.com). All figures have been adjusted for inflation using the U.S. city average consumer price index of all urban consumers, published by the Bureau of Labor Statistics. The Bloomberg New Energy Finance asset finance database tracked deals financing acquisition, new build, and refinancing for utility-scale renewable energy projects. Financing is primarily from private sector entities and includes tax equity, corporate financing, and loans from banks. In the Bloomberg database, estimates have been made for those deals with undisclosed values as well as for untracked deals aiming to close the gaps in coverage caused by timelags in deal discovery. Where portfolios have been financed across multiple states, equal proportions of the financing have been assigned to each state.

The project finance data does not include other types of financing for implementation such as direct purchases by customers, property assessed clean energy (PACE) financing, energy service contracts, or revolving loans.

Exhibit A. SIC Code List For Establishment Review

Industry Code	Energy Efficiency
17420204	Solar reflecting insulation film
17990210	Weather stripping
32110302	Insulating glass, sealed units
32310401	Insulating glass: made from purchased glass
34430304	Economizers (boilers)
38220206	Temperature controls, automatic
38220300	Thermostats and other environmental sensors
38229901	Building services monitoring controls, automatic
38229905	Energy cutoff controls, residential or commercial types
52110300	Insulation and energy conservation products
52110301	Energy conservation products
76990304	Thermostat repair
87110403	Heating and ventilation engineering
87119906	Energy conservation engineering
87489904	Energy conservation consultant
17420203	Insulation, buildings
17990208	Insulation of pipes and boilers
17999920	Glass tinting, architectural or automotive
34430200	Heat exchangers, condensers, and components
34430209	Heat exchangers: coolers (after, inter), condensers, etc.
34430303	Boilers: industrial, power, or marine
36120306	Fluorescent lighting transformers
36459905	Fluorescent lighting fixtures, residential
36460000	Commercial lighting fixtures
36469904	Fluorescent lighting fixtures, commercial
36740102	Diodes, solid state (germanium, silicon, etc.)
36740103	Light emitting diodes
36749915	Thermoelectric devices, solid state
38239903	Combustion control instruments
38250300	Electrical energy measuring equipment
38250306	Energy measuring equipment, electrical
50740200	Heating equipment (hydronic)
87420102	Industrial consultant
87489907	Lighting consultant

Industry Code	Bioenergy
28690104	Ethyl alcohol, ethanol
28690000	Industrial organic chemicals, nec
28690100	Alcohols, non beverage
28690101	Alcohols, industrial: denatured (non-beverage)
28690102	Amyl alcohol
28690103	Butyl alcohol, butanol
28690105	Ethylene glycols
28690106	Grain alcohol, industrial
28210406	Protein plastics

Industry Code	Solar Energy
17110403	Solar energy contractor
34339904	Solar heaters and collectors
36740305	Photovoltaic devices, solid state
36740306	Solar cells
38290218	Solarimeters
50740208	Heating equipment and panels, solar
52110303	Solar heating equipment
32950217	Silicon, ultra high purity: treated
36740212	Thin film circuits
36740213	Wafers (semiconductor devices)
36740302	Photoconductive cells
36749909	Silicon wafers, chemically doped
36740304	Photoelectric magnetic devices
33390302	Silicon refining (primary, over 99% pure)
35599927	Semiconductor manufacturing machinery

Industry Code	Wind Power
35239906	Windmills for pumping water, agricultural
36219909	Windmills, electric generating

Industry Code	Smart Grid
36290102	Electrochemical generators (fuel cells)
36749901	Fuel cells, solid state
73899931	Meter readers, remote
17310101	Co-generation specialization
49319901	Co-generation of electric power
36120100	Power and distribution transformers
36439907	Power line cable
50630100	Transformers and transmission equipment
50630103	Power transmission equipment, electric
50630104	Transformers, electric
38250206	Digital panel meters, electricity measuring
38250304	Demand meters, electric
38250314	Meters: electric, pocket, portable, panel board, etc.
49119901	Distribution, electric power
49119903	Transmission, electric power
50840704	Meters, consumption registering
36920000	Primary batteries, dry and wet
36929900	Primary batteries, dry and wet, nec
50630600	Batteries
50630601	Batteries, dry cell
50630602	Storage batteries, industrial
36740000	Semiconductors and related devices
48999901	Data communication services
50650200	Communication equipment

Industry Code	Multiple Technologies
38239905	Industrial process control instruments
36290103	Inverters, non rotating: electrical
17310100	Electric power systems contractors
17969907	Power generating equipment installation
49119902	Generation, electric power
50639905	Motors, electric
73890200	Inspection and testing services
87310301	Energy research
32110305	Window glass, clear and colored
16299905	Power plant construction
38240101	Gasmeters, domestic and large capacity: industrial
38230000	Process control instruments
38250305	Electrical power measuring equipment
38290000	Measuring and controlling devices, nec
38250000	Instruments to measure electricity
50840000	Industrial machinery and equipment
73720000	Prepackaged software
73730000	Computer integrated systems design
36219900	Motors and generators, nec
33570000	Nonferrous wiredrawing and insulating

Industry Code	Energy Efficiency
238150	Glass and Glazing Contractors
238310	Drywall and Insulation Contractors
238390	Other Building Finishing Contractors
327215	Glass Product Manufacturing Made of Purchased Glass
332913	Plumbing Fixture Fitting and Trim Manufacturing
333318	Other Commercial and Service Industry Machinery Manufacturing
334512	Automatic Environmental Control Manufacturing
335110	Electric Lamp Bulb and Part Manufacturing
335121	Residential Electric Lighting Fixture Manufacturing
335122	Comm, Industrial, and Institutional Electric Lighting Manufacturing
335210	Small Electrical Appliance Manufacturing
335222	Household Refrigerator and Home Freezer Manufacturing
335224	Household Laundry Equipment Manufacturing
335228	Other Major Household Appliance Manufacturing
541350	Building Inspection Services
541614	Process, Physical Distribution, and Logistics Consulting Services
541618	Other Management Consulting Services
541690	Other Scientific and Technical Consulting Services

Industry Code	Bioenergy
111421	Tree crop farming (except forestry)
113210	Forest nurseries for reforestation, growing trees
113310	Logging
115310	Forestry services
311222	Soybean processing
311223	Other oilseed processing
311225	Fats and oils refining and blending
321113	Sawmills
321219	Reconstituted Wood Product Manufacturing
321911	Wood Window and Door Manufacturing
321912	Cut stock, resawing lumber, and planing
322110	Pulp mills
322121	Paper, except newsprint, mills
322122	Newsprint mills
322130	Paperboard mills
325191	Gum and wood chemical manufacturing
325193	Ethyl Alcohol Manufacturing (ethanol)
325199	All Other Basic Organic Chemical Manufacturing
325211	Plastics Material and Resin Manufacturing
325212	Synthetic rubber manufacturing organic chemical mfg.
325221	Cellulosic organic fiber manufacturing
332322	Furnace flues, sheet metal, manufacturing
333210	Sawmill and woodworking machinery
333922	Conveyor and conveying equipment
333999	Steam separating machinery manufacturing; inc. Filters
336212	Truck Trailer Manufacturing
423810	Construction, Mining Machinery & Equipment Merchant Wholesalers
484230	Forest products trucking, long-distance
531190	Forest land rental or leasing
811310	Forestry machinery and equipment repair and maintenance services

Industry Code	Solar Energy
221114	Electric power generation; solar
326113	Unlaminated Plastics Film and Sheet Manufacturing
327992	Ground or Treated Mineral and Earth Manufacturing
331419	Primary Smelting and Refining of Nonferrous Metal
333295	Semiconductor Machinery Manufacturing
423330	Solar reflective film merchant wholesalers

Industry Code	Wind Power
221115	Wind Power Generation
333111	Farm Machinery and Equipment Manufacturing

Industry Code	Smart Grid
221112	Fossil Fuel Electric Power Generation
221121	Electric Bulk Power Transmission and Control
221122	Electric Power Distribution
237130	Power and Communication Line and Related Structures Construction
334111	Electronic Computer Manufacturing
334112	Computer Storage Device Manufacturing
334210	Telephone Apparatus Manufacturing
334220	Radio, Television, Wireless Communications Equipment Manufacturing
334411	Electron Tube Manufacturing
334419	Other Electronic Component Manufacturing
335912	Primary Battery Manufacturing
335921	Fiber Optic Cable Manufacturing
335931	Current-Carrying Wiring Device Manufacturing
517910	Data communication services
517919	All Other Telecommunications
518210	Data Processing, Hosting, and Related Services
561990	All Other Support Services

Industry Code	Multiple Technologies
221110	Electric Power Generation
237990	Power Plant Construction
238160	Solar reflecting coating; roof; application
238210	Electrical Contractors
238220	Plumbing, Heating, and Air-Conditioning Contractors
238290	Other Building Equipment Contractors
327211	Flat Glass Manufacturing
331420	Copper Wire (Except Mechanical) Drawing
331422	Copper Wire (except Mechanical) Drawing
331491	Nonferrous wiredrawing and insulating
332410	Power Boiler and Heat Exchanger Manufacturing
332911	Industrial Valve Manufacturing
333298	Industrial machinery manufacturing
333413	Industrial, Commercial Fan, Blower, Air Purification Equip. Manufacturing
333414	Heating Equipment (except Warm Air Furnaces) Manufacturing
333415	AC & Commercial and Industrial Refrigeration Equipment Manufacturing
333611	Turbine generator sets
333912	Air and Gas Compressor Manufacturing
334290	Other Communications Equipment Manufacturing
334413	Semiconductors and related devices
334513	Instruments and Related Products Manufacturing
334514	Gas meters, domestic and large capacity:industrial
334515	Electrical power equipment
334519	Measuring and control devices
335311	Power, Distribution, and Specialty Transformer Manufacturing
335312	Motor and Generator Manufacturing
335313	Switchgear and Switchboard Apparatus Manufacturing
335910	Battery Manufacturing
335911	Storage Battery Manufacturing
335999	All Other Miscellaneous Electrical Equipment and Component Manufacturing
423610	Electrical Apparatus, Wiring Supplies, Equipment Merchant Wholesalers
423690	Other Electronic Parts and Equipment Merchant Wholesalers
423720	Plumbing and Heating Equipment and Supplies Merchant Wholesalers
423830	Industrial machinery equipment
444100	Building Material and Supplies Dealers
511210	Prepackaged software
541330	Engineering Services
541512	Computer integrated systems design
541710	Research and Development in the Physical, Engineering, and Life Sciences
541990	All Other Professional, Scientific, and Technical Services

Exhibit C. MN DEED'S Clean Energy Survey

The following survey was developed by MN DEED's Economic Analysis unit, in collaboration with MN Department of Commerce, industry stakeholders, and Collaborative Economics.

State of Minnesota: Clean Energy Survey

Introduction

The state of Minnesota is conducting an analysis of its clean energy industry. The results from this survey will be used to complete a detailed industry analysis and help frame future policy discussion. Your participation will assure that we are able to accurately capture the true scope of the industry and its effects on the overall state economy.

Survey results will only be reported in aggregated form and will not identify individual responses. No individual, company-specific information collected in this survey will be published or released. All data collected is considered nonpublic under Minnesota Statute § 13.02, subd. 9. The survey should take 5-10 minutes to complete. Questions denoted by an asterisk (*) are required.

1. Company Name

Company name	
Company phone number	
Street address	
City	
State	
Zip	

2. Is your company in the clean energy industry?*

Companies in the clean energy industry are involved in research, development, manufacture, assembly, installation, management, sales, support or distribution of energy efficiency, renewable energy, biofuels or smart grid products, components or services.

( ) Yes

( ) No (If no, the survey will end.)

3. Who are you responding on behalf of?*

( ) Entire company

( ) Division/Department/Product line

( ) Establishment/Single Location

( ) Other: _____

BASIC BUSINESS INFORMATION

4. In which of the following sectors does your business provide products, components or services?
(Check all sectors that apply).*

( ) Energy Efficiency

( ) Solar

( ) Wind

( ) Bioenergy (including fuels, mass, chemical, etc.)

( ) Smart Grid (including storage and distribution)

5. In Minnesota, how many of your employees work in the clean energy industry?
Add all employees for sectors checked in Question 4.

_____

SECTOR INFORMATION

Note: this page will repeat for each of the items you check in item four. The page will then be sector specific. E.g. If energy efficiency is checked, [SECTOR] will read Energy Efficiency.

This section pertains only to your products, components and services.

6. In Minnesota, how many of your [SECTOR] employees work in the following value chain functions?

( ) Research & development

( ) OEM (Original Equipment Manufacturer)

( ) Supplier of components manufactured in Minnesota

( ) Supplier of components not manufactured in Minnesota

( ) Raw material or feedstock supply

( ) Sales & distribution

( ) Installation & maintenance (including repair)

( ) Project development & financing

( ) Support services (workforce training, marketing, etc.)

7. For your Minnesota operations, estimate the total number of hours per week your employees work on [SECTOR] related products, components or services. (If unknown, you may enter the percent of total employee hours).

_____

8. For your Minnesota operations, estimate the total annual revenue received from [SECTOR] products, components or services.

_____

9. The [SECTOR] sector accounts for what percent of your company's.

_____

10. The [SECTOR] sector accounts for what percent of your company's.

	Percentage related to [SECTOR]
Revenues generated within Minnesota	
Revenues generated outside of the U.S.	

11. For your Minnesota operations, list the top five [SECTOR] products, components or services your company provides or produces.

1. _____

2. _____

3. _____

4. _____

5. _____

INDUSTRY CLASSIFICATION AND FOLLOW-UP

12. What is your six digit Industry or NAICS code?

NAICS is the classification system used by various Federal statistical agencies to group establishments by their economic activity or processes of production. Your company's NAICS can be found at: http://www.census.gov/eos/www/naics.

_____

13. Would you like to be notified when the state finalizes its clean energy industry analysis (completion estimated August 2014)?

( ) Yes

( ) No

14. Would you be willing to participate in a follow up phone survey?

( ) Yes

( ) No

15. Contact information

_____

16. Any additional comments?

_____

Exhibit D. Survey Integration Protocol

The survey integration protocol was developed by Collaborative Economics in collaboration with MN DEED Economic Analysis Unit.

MN DEED SURVEY & NETS/IEGC INTEGRATION PROTOCOL	
Condition	Integration Protocol
If Clean Employment Survey Response is +/- 15% of NETS/IEGC Employment Level in 2014	Use NETS/IEGC Series; apportion sector and value chain according to survey responses where responses available
If Clean Employment Survey Response is less than 85% of NETS/IEGC Employment Level in 2014	Apply Clean Employment share from survey to NETS/IEGC Employment over time; apportion sector and value chain according to survey responses where responses available
If Clean Employment Survey Response is higher than 115% of NETS/IEGC Employment Level in 2014	Cross-check with DEED UI databases and, as appropriate, deflate or apply survey response; apportion setor and value chain according to survey responses where responses available
If Clean Employment Respondent cannot be located in NETS/IEGC Database	Cross-check with DEED UI databases, and if verified, apply MN mean segment growth rate to deflate over time using the survey response as 2014 employment level; apportion sector and value chain according to survey responses where responses available